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WATERPROOF SIGNAL SPLITTER

2 BACKGROUND OF THE INVENTION

3 1. Field of the Invention

4 The present invention relates to a signal splitter, and more particularly to
5 a waterproof signal splitter.

6 2. Description of Related Art

7 A signal splitter is used to split a single signal for two or more
8 connectors so that devices connected to the connectors are able to receive the
9 same signal simultaneously. With reference to Fig. 6, a conventional splitter
10 includes a casing (60) and a seat (70) partially received in the casing (60) and
11 having a pair of connecting plates (72) extending into the casing (60) so that a
12 signal wire (80) is able to extend between the pair of connecting plates (72) to
13 transmit a signal for further application.

14 When the conventional splitter is used, especially outdoors, moisture
15 often seeps into the joint between the seat (70) and the casing (60) and thus
16 causes the signal to become unsteady. That is, the transmitted signal easily
17 suffers from interference by weather conditions when the conventional splitter is
18 concerned.

19 To overcome the shortcoming, the present invention tends to provide an
20 improved waterproof splitter to mitigate the aforementioned problems.

21 SUMMARY OF THE INVENTION

22 The primary objective of the present invention is to provide an improved
23 splitter having a plastic insert received in each of the sleeves and a rubber plug
24 also received in each of the sleeves and engaged with the plastic insert so that

1 after the connecting blade received in the plastic insert is extended through the
2 rubber plug, moisture is completely prevented from entering the casing of the
3 splitter of the present invention so that the signal is steady and will not suffer
4 interference otherwise caused by weather conditions.

5 Other objects, advantages and novel features of the invention will
6 become more apparent from the following detailed description when taken in
7 conjunction with the accompanying drawings.

8 **BRIEF DESCRIPTION OF THE DRAWINGS**

9 Fig. 1 is an exploded perspective view of the splitter of the present
10 invention;

11 Fig. 2 is an exploded perspective view showing the plastic insert, the
12 connecting blade and the rubber plug of the present invention;

13 Fig. 3 is a perspective view showing the engagement between the plastic
14 insert and the rubber plug;

15 Fig. 4 is a schematic cross sectional view showing the assembly of the
16 splitter of the present invention;

17 Fig. 5 is a cross sectional view showing the relative position between the
18 plastic insert and the connecting blade inside the sleeve of the splitter of the
19 present invention; and

20 Fig. 6 is a cross sectional view of a conventional splitter.

21 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

22 With reference to Fig. 1, the waterproof signal splitter in accordance
23 with the present invention includes a hollow casing (10) with threaded sleeves
24. (11) integrally extending out from side faces of the hollow casing (10), plastic

1 inserts (20) each received in a corresponding one of the threaded sleeves (11),
2 rubber plugs (30) each securely connected to a corresponding one of the plastic
3 inserts (20) and connecting blades (40) respectively corresponding to one of the
4 threaded sleeves (11) for connection with signal wires (50).

5 With reference to Fig. 2, the plastic insert (20) is hollow to therefore
6 define therein a tapered path (200) and has a diameter slightly smaller than an
7 inner diameter of the threaded sleeve (11) so that the plastic insert (20) is able to
8 be received in the threaded sleeve (11) in a watertight manner. The plastic insert
9 (20) has ribs (21) longitudinally formed on an outer periphery of the plastic
10 insert (20) and positioning plates (22) formed on an inner face of the plastic
11 insert (20).

12 The rubber plug (30) has a top portion (31), a mediate portion (32) and a
13 bottom portion (33). The mediate portion (32) has a diameter larger than those of
14 the top portion (31) and the bottom portion (33). Further the top portion (31) has
15 a diameter larger than a diameter of the bottom portion (33). The diameter of the
16 bottom portion (33) is slightly smaller than the inner diameter of the plastic
17 insert (20) so that the bottom portion (33) is able to extend into the path (200) of
18 the hollow plastic insert (20) to have a watertight engagement with the inner
19 surface of the tapered path (200). The extension of the rubber plug (30) into the
20 plastic insert (20) is stopped by the mediate portion (32). Furthermore, the rubber
21 plug (30) has a passage (34) longitudinally defined through the rubber plug (30).

22 The connecting blade (40) is made of metal and able to transmit a signal.
23 With reference to Fig. 3, when the plastic insert (20), the rubber plug (30)
24 and the connecting blade (40) are assembled, it is noted that the bottom portion

1 (33) is received in the plastic insert (20) and the connecting blade (40) is
2 extended out of the rubber plug (30) from the passage (34).

3 With reference to Figs. 4 and 5 and still using Fig. 1 as a reference, it is to
4 be noted that when the assembly shown in Fig. 3 is assembled with the hollow
5 casing (10), the assembly including the plastic insert (20), the rubber plug (30)
6 and the connecting blade (40) is extended into a corresponding threaded sleeve
7 (11). After the extension of the connecting blade (40) into the plastic insert (20)
8 and through the passage (34) of the rubber plug (30), because the passage (34)
9 has a dimension smaller than a dimension of the connecting blade(40), an inner
10 surface defining the passage (34) is able to have a watertight engagement with an
11 outer surface of the connecting blade (40) and therefore to position the
12 connecting blade (40) inside the rubber plug (30). Furthermore, the positioning
13 plates (22) inside the plastic insert (20) are able to position the connecting blade
14 (40) inside the plastic insert (20). Further, the ribs (21) on the outer periphery of
15 the plastic insert (20) increase the friction with the inner face of the threaded
16 sleeve (11). Thereafter, the signal wire (50) is able to be extended to connect to
17 the connecting blade (40) for transmission of a signal.

18 It is appreciated that due to the addition of the plastic insert (20) and the
19 rubber plug (30) and of course the extension of the connecting blade (40)
20 directly extending through the rubber plug (30), moisture from the surrounding
21 air is prevented from entering the hollow casing (10), and thus interference to the
22 signal is avoided. Preferably, the positioning plates (22) are diametrically and
23 diagonally formed inside the plastic insert (20) so as to provide efficient support
24 to the connecting blade (40). Further, the threaded sleeve (11) has a step (12)

1 formed on the inner face of the threaded sleeve (11) to correspond to the top
2 portion (31) of the rubber plug (30) such that the rubber plug (30) is secured
3 inside the threaded sleeve (11). Still further, the bottom portion (33) is
4 configured to have a shape corresponding to a shape of the hollow plastic insert
5 (20) such that after the bottom portion (33) is received in the plastic insert (20),
6 the rubber plug (30) is immovable relative to the plastic insert (20).

7 It is to be understood, however, that even though numerous
8 characteristics and advantages of the present invention have been set forth in the
9 foregoing description, together with details of the structure and function of the
10 invention, the disclosure is illustrative only, and changes may be made in detail,
11 especially in matters of shape, size, and arrangement of parts within the
12 principles of the invention to the full extent indicated by the broad general
13 meaning of the terms in which the appended claims are expressed.